IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF:

HIROSHI URABE ET AL

SERIAL NO. 09/870,716 GROUP ART UNIT: 1711

EXAMINER: NATHAN M. NUTTER

FOR: THERMOPLASTIC RESIN COMPOSITION

DECLARATION UNDER 37 C.F.R. 1.132

HONORABLE COMMISSIONER OF PATENTS & TRADEMARKS

WASHINGTON, D.C. 20231

SIR:

Now comes Masami SUZUKI, a citizen of Japan, and a resident of c/o Mitsubishi Engineering-Plastics Corporation, Technical Center, 6-2, Higashi-Yahata 5-chome, Hiratsuka-shi, Kanagawa-ken, Japan, who declares and says that:

1. I graduated from Tokyo Metropolitan College of Aeronautical Engineering, Department of Mechanical Engineering, in March, 1992.

2. I was an employee of Mitsubishi Kasei Corporation 1992-1994 and have been an employee of Mitsubishi

Engineering-Plastics Corporation since 1994 and have been engaged in the study of a thermoplastic resin.

3. I am one of inventors of U.S. Patent Application, Serial No. 09/870,716.

4. I have read the Office Action dated November 21, 2005, have understood the Examiner's rejection of the invention claimed in the above application. Then, under my control, the following Experiments were carried out.

Experiments 1 and 2

<Materials>

The following materials were used.

(1) Polyamide-6 (PA6):

NOVAMIDE 1010J (registered trademark; produced by Mitsubishi Engineering-Plastics Corporation; relative viscosity: 2.5)

(2) Polyphenylene ether-based resin (PPE):

UPIACE PME50 (registered trademark; produced by Mitsubishi Engineering-Plastics Corporation; rubber-containing acid-modified PPE)

(3) Phosphazene compound:

Phosphazene compound was prepared according to the description of "Synthesis Example 1 (Production of phenoxy phosphazene)" of our invention. The GPC analysis of the

reaction product showed that the weight-average molecular weight (Mw) thereof was 810 calculated as polystyrene, and the amount of residual chlorine contained in the reaction product was 0.09%. Also, as a result of phosphorus and CHN elemental analysis, it was confirmed that the reaction product was a compound represented by a structural formula: $[N=P(-O-Ph)_{2.00}]$ wherein -Ph is phenyl.

(4) Glass fiber

ECS03T-249GH (produced by Nippon Denki Glass Co., Ltd.)

<Production of test specimens>

Components shown in Table 1 were weighed and mixed together at mixing ratios as shown. The resin content of Experiment 1 (PA6 + PPE = 60 parts) was equal to the resin content of Experiment 2 (PA6 = 60 parts). The other components (phosphazene compound and glass fiber) were used in the same amount in Experiments 1 and 2. Therefore, the blending ratio of phosphazene compound/resins is equal in Experiments 1 and 2.

The resultant mixture was melt-kneaded at a cylinder temperature of 270°C using a twin-screw extruder ("TEX30HCT" manufactured by Nippon Seikosho Co., Ltd.), thereby producing resin pellets. The thus obtained pellets were dried under reduced pressure at 120°C for 8 hours, and then injection-molded at a cylinder temperature of 270° using an

injection-molding machine ("J75ED" manufactured by Nippon Seikosho Co., Ltd.), thereby producing plate-like test specimens (size: 100 mm X 100 mm X 2 mm).

<Evaluation method of surface condition of test specimens>

The above obtained test specimen whose weight had been measured was completely dipped into acetone for 30 seconds in a glass schale whose weight had been measured. After took out the test specimen, the test specimen and schale was air-dried and the acetone was vaporized under normal pressure and ordinary temperature to obtain dried test specimen and schale.

Acetone is a solvent for the phosphazene compound but a poor solvent for the above polyamide-6 resin and polyphenylene ether-based resin. Therefore, by the above dipping treatment in acetone, the bled out phosphazene compound to the surface of test specimen was dissolved into acetone but the polyamide-6 resin and polyphenylene ether-based resin were not affected.

After air-dried, the weights of test specimen and schale were measured and the decrease of weight in the test specimen and the increase of weight in the schale were calculated by comparing the weights before test, respectively to determine the weight of bled-out matter on

the surface of test specimen which are dissolved into acetone.

Further, the bled-out matter which was remained in the schale was collected and identified by means of IR spectra measurement.

The evaluation results are shown in Table 1.

Still further, the gloss was determined by a photograph of surface of test specimen. Each photograph of test specimen is attached herewith.

Table 1

	Experiment 1	Experiment 2
Composition (wt. part[1)])		
PA6	40	60
PPE	20 (200%)	-
Phosphazene compound	10	10
Glass fiber	30	30
Evaluation results		
Bleed-out percentage {(B)g/(A)g}X100 (wt%)	0.004	0.05
Identification of dissolved matter in the acetone by IR measurement	Phosphazene Compound	Phosphazene Compound

Note: 1) Weight percentage of PPE (value in the parenthesis) was based on the weight of phosphazene compound

Remarks

In Experiment 1 (within our invention), the dissolved part of test specimen into acetone is identified as the phosphazene compound. However, the weight of dissolved part of test specimen into acetone is very small amount and calculated bleed-out percentage is only 0.004 wt%. Further, in the photograph of surface of test specimen, there is a sufficient gloss because the fluorescent light reflected on the surface of test piece can be clearly confirmed (see center part, two fluorescent light tubes can be clearly confirmed). Therefore, it is clearly understood that the bled-out phosphazene compound is very small amount and the surface of test piece is glossy surface. Also when touching the surface of test piece, there was no sticky feeling because of very few bled-out phosphazene compound.

On the other hand, in Experiment 2 (out of scope of our invention), in which the test specimen contained no anti-bleed-out resin such PPE, the dissolved part of test specimen into acetone is identified as the phosphazene compound. The weight of dissolved part of test specimen into acetone cannot be neglected and calculated bleed-out percentage is 0.05 wt%. Namely, the weight of bled-out phosphazene compound are more than ten times in case of Experiment 1. This bleed-out phosphazene compound in large amount greatly affects the surface glossness of test piece.

As seen from the photograph of surface of test specimen in Experiment 2, it is clearly understood that it is difficult to observe the reflection of fluorescent light on the surface of test piece because the surface of test piece is cloudy. When touching the surface of test piece, there was very sticky feeling because of large amount of bled-out phosphazene compound.

5. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

6. Further, deponent saith not.

Date: March 9, 2006

Masami Suzuki

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